



CLAIMS:

1-7 (canceled)

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8. (previously presented) A method for the assembly of a semiconductor device having fatigue-resistant interconnection elements, comprising the steps of:

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providing a semiconductor chip having at least one solder bump comprising an alloy of about ten weight percent tin and about ninety weight percent lead;

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providing a solder paste comprising tin and silver, said solder paste having a reflow temperature of about 221 °C, said bump alloy having a melting temperature higher than said paste reflow temperature;

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bringing said solder bump in contact with said solder paste and immersing said bump partially in said paste;

supplying thermal energy to reflow said solder paste at about 235 °C;

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controlling the amount of energy and time after said melting of said solder paste so that the molten paste dissolves a pre-determined amount of said solder bump to form a tin/lead/silver ternary alloy of about eutectic composition without melting said solder bump; and

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removing said thermal energy to cool said ternary alloy fillet and said bump.

9. (original) The method according to Claim 8 wherein said solder paste is a binary solder paste having a composition of 2 to 3 weight percent silver and 97 to 98 weight percent tin so that the formation of primary Ag_3Sn plates in said fillet is avoided.
10. (original) The method according to Claim 9 wherein said binary solder alloy paste has a composition of about 2.5 weight percent silver and about 97.5 weight percent tin.
11. (original) The method according to Claim 8 wherein said solder paste is a ternary solder paste having up to 20 weight percent lead, up to 3 weight percent silver, and the balance tin.
12. (original) The method according to Claim 8 wherein said bump alloy has a melting temperature higher than 275 °C.
13. (original) The method according to Claim 8 wherein said bump alloy comprises about 10 weight percent tin and about 90 weight percent lead.
14. (original) The method according to Claim 8 wherein said controlling of energy and time comprises a temperature above 176 °C for about 70 seconds.
15. (original) The method according to Claim 8 wherein said ternary alloy comprises about 1.62 weight percent silver, about 36.95 weight percent lead, and about 61.43 weight percent tin.